

Appl. No. 09/817,963

Amdt. dated 6/6/05

Reply to Office action of 1/13/05

REMARKS

Reconsideration of the application is requested.

Claims 4-7 remain in the application. Claims 1-3 have been previously canceled.

In item 3 under "Claim Rejections - 35 USC 103" on page 2 of the above-identified Office Action, claims 4-7 have been rejected as being unpatentable over Arbach et al. (U.S. Patent 5,021,129) (hereinafter "Arbach") in combination with Boyko et al. (U.S. Patent 6,212,769) (hereinafter "Boyko") or Amelio et al. (U.S. Patent 4,448,804) (hereinafter "Amelio") or vice versa, further in combination with Bickford et al. (U.S. Patent 5,800,858) (hereinafter "Bickford") under 35 U.S.C. § 103(a).

As will be explained below, it is believed that the claims were patentable over the cited art in their previous form and, therefore, the claims have not been amended to overcome the references.

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Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 4 calls for, *inter alia*, a process for metallizing at least one insulating layer of an electronic or microelectronic component, by:

activating the entire first insulating layer by treatment with an activator, the activator being at least one of a gas, a liquid, a solution, and a plasma;

then, after activating the entire first insulating layer, applying and patterning a second insulating layer made of a photosensitive material; and

then, after applying and patterning the second insulating layer, seeding and metallizing regions of the first insulating layer that are exposed by the patterning step. (emphasis added)

Applicants respectfully point out that an important aspect of the present invention is based on feature that an activation of the first layer retains its effects with regard to the seeding, even when the activated first layer is covered with a second layer before it is seeded, which second layer is subsequently structured so that partial regions of the

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activated first layer are exposed, as recited in claim 4 of the instant application.

Arbach does not disclose a photolithographic method, and does not disclose or suggest "applying and patterning a second insulation layer made of a photosensitive material" as recited in claim 4. Nor does Arbach disclose activating the entire first insulating layer by treatment with an activator prior to applying the second layer as set forth in independent claim 4 and acknowledged by the Examiner. Arbach is completely silent with regard to providing process steps according to the present claimed invention. Because of the basic deficiencies of Arbach, the Examiner finds it necessary to form a mosaic of references in an unsuccessful attempt to show the claimed invention.

The Examiner states that Arbach shows forming a first electroactive layer and then a second electroactive layer. Subsequently, the second electroactive layer is structured in order to form exposed regions. The exposed regions of the first layer are then activated by seeding and subsequently metallized in order to form conductor lines (conductive tracks).

Arbach uses only materials for the two layers which have a

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different redox potential, since only one activation method is disclosed. Activation is accomplished by using electrons, which are provided with a potential selected such that it can be assured that there is sufficient potential so that the exposed regions can be activated. Activation is not achieved by treating the first layer with an "activator being at least one of a gas, a liquid, a solution, and a plasma" as recited in claim 4 of the instant application.

Furthermore, in Arbach the seeding is performed immediately after the activation. This means that, between the activation of the exposed first layer and the seeding of the activated partial region, no further layer (or "second insulating layer" as recited in claim 4) is formed on the activated region of the first layer.

This is in contrast to the present invention, which provides a flexible method for applying a metal layer onto an insulating layer without requiring additional seeding.

The present invention achieves this by providing the entire first layer being activated prior to the application of the second insulating layer, and then the second layer being applied, as recited in independent claim 4. Since the activation of the first layer is performed prior to the application of the second layer, which is possible because

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activation is by fluids, solution, plasma, or a gas (as recited in claim 4), it is not necessary to form the second insulating layer from a different material than the first insulating layer. The subsequent seeding only takes place on the exposed regions of the activated first insulating layer so that no unnecessary or additional seeding is used.

As previously stated, an important feature of the present invention is that an activation of the first layer maintains its effects regarding the seeding, even if the activated layer is covered with a second layer prior to seeding, which second layer is subsequently structured in order to expose partial regions of the activated first layer. Thus, the method according to the present claimed invention is much more flexible with regard to material selection without requiring more seeding and therefore, patentably distinguishes over the prior art applied by the Examiner.

Arbach discloses forming a first electroactive layer and then a second electroactive layer. Subsequently, the second electroactive layer is structured to form uncovered (exposed) regions. These exposed regions are activated by seeding and then metallized to form conductor lines. According to Arbach, the materials used for the two layers must have a different redox potential, because only one activation method is

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disclosed and activation is achieved by using electrons having a potential selected such that, by using the potential, only the exposed regions can be activated, not the entire first insulating layer as claimed. This kind of activation shows the disadvantage, for example, that a voltage source and a cabling must be provided, which is eliminated by the method according to the claimed invention. Thus, the process according to the present claimed invention is significantly simpler than the method disclosed in the prior art as typified by Arbach, in particular by eliminating cabling. Arbach does not disclose seeding and metallizing regions of the first insulating layer that are exposed (by the patterning) after applying and patterning the second insulating layer.

Further, it is submitted that a person of skill in the art having Arbach before him, would not necessarily look to Boyko or Amelio to make up for the deficiencies of Arbach, or to arbitrarily add features as suggested by the Examiner.

In Boyko and Amelio, the entire surface of a first layer is roughened, however, in both references, the entire surface, which includes even those regions on which there are no metallizations, i.e., no conductor tracks are formed, is subsequently seeded. Thus, the quantity of the required seeding is significantly increased. It is not technically

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practical or feasible to "reduce the amount of seeding" or "improve adherence of the deposited seed" as alleged by the Examiner as the basis for combining the secondary references with Arbach. Exactly the opposite of what the Examiner hopes to accomplish would occur, because such a combination of references would actually increase the quantity of the seeding. According to Arbach, only the exposed regions of the first layer are activated and seeded after the structuring of the second layer, so that the required seeding used in Arbach is less than that used in Boyko or Amelio.

Bickford does not overcome the deficiencies of Arbach or any combination of Arbach with Boyko or Amelio, notwithstanding that such a combination is improper. Bickford does not show the sequence of steps recited in independent claim 4 of the instant application as previously discussed. Nor is the claimed invention disclosed or suggested by a combination of Arbach and Boyko or Amelio, and Bickford.

Applicants submit that the only basis for even combining the references as proposed by the Examiner is hindsight reconstruction of the prior art after having read applicants disclosure and that the Examiner has not relied on only "knowledge which was within the level of ordinary skill at the time the claimed invention was made." On the contrary, the

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Examiner has dissected the claims and recognized that that the primary reference of Arbach is substantially deficient with respect to the claimed features and then arbitrarily selected features from prior art to make up for those deficiencies. Applicants submit that the Examiner's suggested combination of references is nothing more than a futile attempt to show the present claimed invention by a mosaic of individual isolated features from different references. The Examiner's proposed combination of references is considered improper, notwithstanding the Examiner's statements in the above-identified Office Action.

A critical step in analyzing the patentability of claims pursuant to 35 U.S.C. § 103 is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." Id. (quoting W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983)).

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Most if not all inventions arise from a combination of old elements. See In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453,1457 (Fed. Cir. 1998). Thus, every element of a claimed invention may often be found in the prior art. See id. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See id. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the appellant. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 163.5, 1637 (Fed. Cir. 1998); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125,1127 (Fed. Cir. 1984).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. In addition, the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. See WMS Gaming, Inc. v. International Game Tech., 184 F.3d 1339, 1355, 51 USPQ2d 1385, 1397 (Fed. Cir. 1999). The test for an

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implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. See In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (and cases cited therein). Whether the examiner relies on an express or an implicit showing, the examiner must provide particular findings related thereto. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. Broad conclusory statements standing alone are not "evidence." Id. When an examiner relies on general knowledge to negate patentability, that knowledge must be articulated and placed on the record. See In re Lee, 277 F.3d 1338, 1342-45, 61 USPQ2d 1430, 1433-35 (Fed. Cir. 2002).

Upon evaluation of the Examiner's comments, it is respectfully believed that in this instance the evidence adduced by the Examiner is insufficient to establish a prima facie case of obviousness with respect to the claims. Accordingly, the Examiner is requested to withdraw the rejection.

The references do not show "activating the entire first insulating layer by treatment with an activator, the activator being at least one of a gas, a liquid, a solution, and a plasma; then, after activating the entire first insulating layer, applying and patterning a second insulating layer made of

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a photosensitive material; and then, after applying and patterning the second insulating layer, seeding and metallizing regions of the first insulating layer that are exposed by the patterning step" as recited in claim 4.

Nor do the references show the feature of "patterning the first insulating layer before the entire first layer is activated and before the second insulating layer is applied" as recited in dependent claims 6 and 7 of the instant application.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 4. Claim 4 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 4 and further because claims 6 and 7 per se recite limitations that are not shown in the prior art.

In view of the foregoing, reconsideration and allowance of claims 4-7 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a

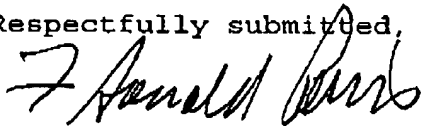
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telephone call so that, if possible, patentable language can be worked out.

Petition for extension is herewith made. The extension fee for response within a period of two month pursuant to Section 1.136(a) in the amount of \$450.00 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,



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FDP/bb

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